

REMARKS/ARGUMENTS

Claims 1-22 were previously pending in the application. Claims 1 and 22 are amended; and new claims 23-38 are added herein. Assuming the entry of this amendment, claims 1-38 are now pending in the application. The Applicant hereby requests further examination and reconsideration of the application in view of the foregoing amendments and these remarks.

On page 2 of the office action, the Examiner rejected claims 1-2, 9, 18-19, and 22 under 35 U.S.C. 102(e) as being anticipated by Marash. On page 3, the Examiner objected to claims 3-8, 10-17, and 20-21 as being dependent upon a rejected base claim, but indicated that those claims would be allowable if rewritten in independent form. For the following reasons, the Applicant submits that all of the now-pending claims are allowable over the cited references.

Claims 1-22

Claims 1 and 22 have been amended to clarify differences between the present invention and the teachings in Marash. According to currently amended claim 1, after filtering the audio signal from each microphone to generate a processed audio signal for each microphone, the processed audio signals are combined in a nonlinear manner to form an acoustic beam that focuses the array on one or more desired regions in space by performing nonlinear signal estimation processing on the processed audio signals from the microphones to generate an output signal for the array, wherein the nonlinear signal estimation processing discriminates against noise originating at an unknown location outside of the one or more desired regions. Marash does not teach or even suggest such a combination of features.

Marash teaches a beamforming technique that differs from the invention of claim 1 in two important ways, either of which would be enough to make the present invention patentable over Marash.

First of all, in Marash, the processed audio signals generated by filtering the audio signal from each microphone in an array are combined linearly (e.g., simply added together). See, e.g., adder 20 of Fig. 1; adder 40 of Fig. 2; and step 64 of Fig. 2a. In column 7, lines 1-10, Marash teaches that, in Fig. 2, the beam channel is formed via "the classic delay and sum beamforming process," in which the delayed inputs are linearly combined (i.e., summed) as shown in Fig. 1. Marash goes on to explicitly teach that "the alternatives include any linear combination of sensor outputs." See column 7, lines 8-9. See, also, column 7, lines 10-14 ("forming some other linear combination of sensor outputs"). Thus, Marash does not teach or even suggest a beamforming technique that relies on a nonlinear combination of filtered inputs. For this reason alone, the present invention would be patentable over Marash.

In addition, in Marash, the noise is assumed to originate at a known location. In column 7, lines 10-12, Marash explicitly teaches that "The reference channels are processed such that a null is placed towards the looking direction." The purpose of a null is to discriminate against noise, but, in Marash, the direction of the noise is assumed to be known (i.e., towards the looking direction). Thus, Marash does not teach or even suggest a beamforming technique that discriminates against noise originating at an unknown location. For this reason also, the present invention is patentable over Marash.

For all these reasons, the Applicant submits that claim 1 is allowable over Marash. For similar reasons, the Applicant submits that claim 22 is allowable over Marash. Since claims 2-21 depend variously from claim 1, it is further submitted that those claims are also allowable over Marash. The Applicant submits therefore that the rejections of claims under Section 102(e) have been overcome.

Claims 23-38

Support for new claims 23-38 is as follows:


<u>New Claim</u>	<u>Supporting Claims</u>
23	1+3
24	1+4
25	5
26	6
27	7
28	1+8
29	1+9+10
30	1+11
31	12
32	13
33	14
34	15
35	16
36	17
37	1+19+20
38	21

New claims 23, 24, 28, 29, 30, and 37 are equivalent to original claims 3, 4, 8, 10, 11, and 20, respectively, rewritten in independent form. Since the Examiner stated that original claims 3, 4, 8, 10, 11, and 20 would be allowable if rewritten in independent form, the Applicant submits that new claims 23, 24, 28, 29, 30, and 37 are allowable. Since claims 25-27, 31-36, and 38 depend variously from claims 24, 30, and 37, respectively, it is further submitted that those claims are also allowable.

In view of the above amendments and remarks, the Applicant believes that the now-pending claims are in condition for allowance. Therefore, the Applicant believes that the entire application is now in condition for allowance, and early and favorable action is respectfully solicited.

Respectfully submitted,

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